Supplemental Document

Biomedical Optics EXPRESS

Multimodal fusion of EEG-fNIRS: a mutual information-based hybrid classification framework: supplement

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Supplement DOI: https://doi.org/10.6084/m9.figshare.14038913

Parent Article DOI: https://doi.org/10.1364/BOE.413666

Supplementary Material

In this supplementary section, we present the figure and explanation of the experimental paradigm.

The participants were asked to perform a visuo-mental paradigm based on the conventional visual oddball paradigm followed by a mathematical task, as fully described in our previous work [1]. Fig. S1 shows the oddball P300 paradigm, but with a 2×2 matrix of digits displayed over the intensified letter in our visuo-mental dual-task paradigm. Each subject was instructed to focus on a target character (14 targets per run), while each row and column was intensified once per trial to cause two target intensifications per character. Upon each target intensification, subjects were instructed to perform predefined mental arithmetic tasks, i.e., add pairs of numbers in the matrix either diagonally (first target flash) or vertically (second target flash), and then double the larger result from their addition. The stimulation intensification time was set to 300 ms, followed by a 6 sec inter-stimulus interval (ISI). The relatively long ISI adopted compared to conventional EEG-based oddball tasks allowed the fNIRS recordings to reflect evoked hemodynamic activities.

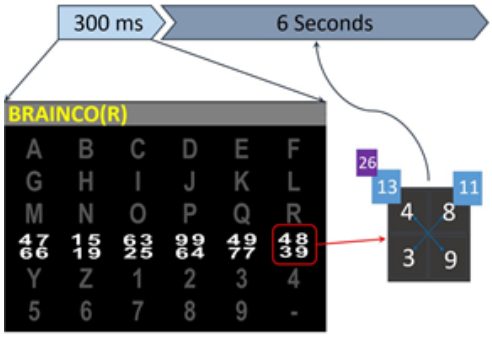

Fig S1. The oddball-based visuo-mental dual-task paradigm and an example of the arithmetic operation the participant performed.

[1] S.B. Borgheai, R.J. Deligani, J. McLinden, A. Zisk, S.I. Hosni, M. Abtahi, K. Mankodiya, Y. Shahriari, Multimodal exploration of non-motor neural functions in ALS patients using simultaneous EEG-fNIRS recording, J. Neural Eng. (2019).